



PATENT IBM217 YO996-049XB

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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#14
7/24/01
AS

In re Application of : Marie Angelopoulos, et al.
Serial Number : 09/346,353
Filing Date : July 2, 1999
Examiner : T. Yoon
Group Art Unit : 1714
For : METHODS OF FABRICATING
PLASTICIZED,
ANTIPLASTICIZED AND
CRYSTALLINE CONDUCTING
POLYMERS AND PRECURSORS
THEREOF.

TO: The Honorable Board of Patent Appeals
and Interferences
Washington, D.C. 20231

APPEAL BRIEF

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TC 1700

Sir/Madam:

Three copies of this brief are submitted in support of Applicants' appeal of the Examiner's rejections of claims 1 - 16, 20, 22 - 25 and 40 - 42 in the above-identified application. The Appeal Fee for filing a brief in support of this Appeal in the amount of \$310.00 should be charged to Deposit Account 50-0510. An extra copy of this authorization page is enclosed.

1. **REAL PARTY IN INTEREST**

The Parties, comprising Marie Angelopoulos, et al. listed as inventors in above-identified caption are the real parties in interest in this matter. The application has been assigned by them to *International Business Machines Corporation*, Armonk, NY which has authorized this appeal.

2. **RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences pending that relate to this case.

3. **STATUS OF CLAIMS**

The status of the claims with respect to the instant application is as follows:

As originally filed: claims 1 - 45

Pending: Claims 1 - 16, 20, 22 - 25 and 40 - 42.

Cancelled: (By way of withdrawal from consideration in this case)

Claims 17 - 19, 21, 26 - 39 and 43 - 45.

Appealed: Claims 1 - 16, 20, 22 - 25 and 40 - 42.

4. **STATUS OF AMENDMENTS**

There was a single amendment filed prior to the final rejection. There was no amendment filed in response to the final rejection. Claims 4, 10 and 24 were modified in the aforementioned amendment submitted in response to the first Official Action. The amendments were directed toward consistent language and toward including additional elements in the claimed composition (See Claim 24 as amended).

5. SUMMARY OF THE INVENTION

The present invention relates generally to a method of forming an admixture of a solvent, an additive and a polymer selected from the group consisting of a precursor to an electrically conductive polymer or an electrically conductive polymer. The polymer is soluble in the solvent and the polymer is not substantially soluble in the additive in the absence of the solvent. If and/or when the aforesaid solvent is removed or partially removed, the additive provides local mobility to the polymer to allow the polymer chains to tightly associate with one another to achieve a high crystalline state. The additive provides a plasticization effect.

In accordance with the invention, the admixture is electrically conductive and has an isotropic electrical conductivity.

The polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylene vinylenes, polyparaphenylenes, polyanilines, polythiophenes, polyazines, polyfuranes, polypyrroles, polyselenophenes, poly-p-phenylene sulfides, polyacetylenes formed from soluble precursors, combinations thereof with other polymers and copolymers of the monomers thereof.

The additive is selected from the group consisting of plasticizers and diluents. Specific plasticizers are: Adipic acid plasticizers, Azelaic acid plasticizers, Benzoic acid plasticizers, Citric acid plasticizers, Dimer acid plasticizers, Epoxy plasticizers, Fumaric acid plasticizers, Glycerol plasticizers, Isobutyrate plasticizers, Lauric acid plasticizers, Linoleic acid plasticizers, Maleic acid plasticizers, Sebacic acid plasticizers, Stearic acid plasticizers, Succinic acid plasticizers, Sulfonic acid plasticizers, Terpentines, Terpentine plasticizers, Siloxanes, Mellitates, Myristic acid plasticizers, Oleic acid plasticizers, Palmitic acid plasticizers, Paraffin plasticizers, Phosphoric acid plasticizers, Phthalic acid plasticizers, Ricinoleic acid plasticizers, Polysiloxanes, Ethylene glycols, Polyethylene glycols, Polyesters, Sucrose plasticizers, Tartaric acid plasticizers, Trimellitic acid plasticizers, Glycol plasticizers, Glycolates, Hydrocarbons, Phosphonic acid plasticizers and Polysilanes.

The solvents used in the present invention are: N-methyl pyrrolidinone, dimethyl sulfoxide, dimethyl formamide, pyridine, toluene, xylene, m-cresol, phenol, dimethylacetamide, tetramethylurea, n-cyclohexylpyrrolidinone, aqueous acetic acid, aqueous formic acid, pyrrolidinone, N,N'-dimethyl propylene urea (DMPU), benzyl alcohol, water, dimethyl propylene urea.

6. ISSUE

1. Do the diverse references cited by the Examiner anticipate the pending Claims under 35 U.S.C. § 102(b) or in the alternative and in combination render them obvious under 35 U.S.C. § 103(a)?

2. Is the specification as filed objectionable as containing subject matter which was not described therein in such a way as to convey to one skilled in the art that the inventor, at the time the application was filed, had possession of same as required by 35 U.S.C. § 112, first paragraph?

7. GROUPING OF CLAIMS

Claims 1, 7, 11 and 12 are the independent and therefore broadest claims in the instant application. The remaining claims are all dependent claims. These are the main claims for consideration in this appeal. Claims 1, 7 and 12 cover methods of forming different embodiments and Claim 11 is a method of forming a specific composition. The consideration of Claim 1 should be the main focus in this appeal as Claims 7, 11 and 12 are variations of the method found in Claim 1. They should be considered after Claim 1 is evaluated.

8. ARGUMENTS

During the course of the prosecution of the instant application, the Examiner made rejections under 35 U.S.C. § 102(b), 35 U.S.C. §103(a) and 35 U.S.C. §112, first paragraph.

AS TO 35 U.S.C. §112, first paragraph :

Claims 24 and 40-42 have been rejected under 35 USC 112. Applicants do not understand how the Examiner's "New Matter" comments relate to claim 24 which recites "a monomer, of said precursor and said oxidant". If an oxidative polymerization were done there would be monomers and oxidants in the solution. Also, monomer and oxidants could be subsequently added. Claim 24 has been amended to clarify the language. As to claims 40-42 an additive, a plasticizer and a material as claimed can be an oxidant in addition to having other properties. In view of the multiproperty feature of the compounds, denial of this rejection is proper by this Honorable Board.

As to the Official Actions issued by the Examiner, there were rejections of various Claims as detailed below pursuant to 35 U.S.C. §102(b) and 35 U.S.C. §103(a).

AS TO 35 U.S.C. §102(b) and § 103(a) :

QUERY: Do the Han, Ikkala et al. or Cao, et al. references cited by the Examiner, provide a clear and concise teaching therein that anticipates each and every element recited in Applicants' claims or renders them obvious?

Argument: The Board is respectfully requested to reconsider the Examiner's rejection of claim 11 recited in the Official Action as anticipated by the United States Patent references cited above.

Claim 11 has been rejected under 35 U.S.C. 102(b) as anticipated or under 35 U.S.C. 103(a) as obvious over Han, (United States Patent 5,171,478), Ikkala et al. (United States Patent 5,520,852) or Cao et al. (United States Patent 5,232,631). The Examiner asserts that the cited art shows treatment of conducting polymers by plasticizers or solvents. The Examiner points to no teaching in these references to support the statement. There is no teaching of isotopic electrical conductivity in these references and the materials of these references are not made in the same way as applicants' materials. There is no suggestion in these references that isotopic electrical conductivity can exist in an electrically conductive polymer.

Claims 1-16, 20, 22, 23 and 25 have been rejected under 35 USC 102(b) as anticipated by Han or, under 35 U.S.C. 103(a) as obvious over Han, (United States Patent 5,171,478). The Examiner comments in his rejection on Example 6 pointing to where Han teaches stretch orientation and contends that Han teaches the use of a plasticizer and a solvent.. The Examiner has totally ignored the rest of the limitations in Applicants' claims as rejected (1-16, 20, 22, 23 and 25) for which there is no teaching or suggestions in Han and Cao et al. Applicants claims distinguish over Han in that they have included limitations which are not found in Han which render the subject matter patentable.

Claims 1-16, 20, 22, 23 and 25 have also been rejected under 35 U.S.C. 102(b) as anticipated by Cao et al. or under 35 U.S.C. 103(a) as obvious over Cao et al. In each of the rejections cited above to Han and Cao, et al. respectively, the Examiner has stated:

"The recited plasticizers of Han would not substantially dissolve polyanilines in the absence of a solvent, and would provide local mobility to polyanilines. The recited plasticizers of Han would not substantially dissolve in polyanilines [n]either."

"The recited plasticizers of Cao would not substantially dissolve polyanilines in the absence of a solvent, and would provide local mobility to polyanilines. The recited plasticizers of Cao et al. would not substantially dissolve in polyanilines."

In these statements the Examiner appears to acknowledge that neither Han nor Cao et al. teach using a solvent as claimed by applicants. He denies subsequently that this is what he meant. The references are not anticipatory nor do they render the invention obvious. Their teachings are not complete for the purpose of properly rejecting the claims. The CAFC clearly made this point in *Paperless Accounting, Inc. v. Bay Area Rapid Transit Sys.*, 804 F.2d 659, 231 USPQ 649 (Fed. Cir. 1986) where it stated: "...reference must sufficiently describe the claimed invention to have placed the public in possession of it."

Based upon what the Examiner has stated on the record, the rejected claims cannot be anticipated by Han or Cao et al. and thus the rejection of these claims under 35 U.S.C. 102(b) is improper. In the statements made by the Examiner, he has *sua sponte* added information not taught in Han or Cao et al., but which is taught by applicants, i.e., the use of a solvent. The Examiner is using applicants teaching to add to Han and Cao et al. This is improper. For the Examiner to properly make the assertions that he has on the record with respect to rejecting the Applicants' Claims, the Examiner must produce references to support his statements or an Affidavit as provided for under 37 C.F.R. 104(d)(2) for the Examiner to qualify himself as an expert to make these statements. The alternative for the Examiner is to withdraw the rejection.

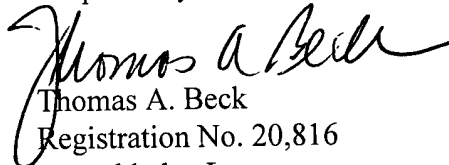
Claims 5 and 9 had been rejected under 35 U.S.C. 112 for use of the terminology "substituted". Applicants disagreed with the Examiner's position in their subsequent response. In the most recent Official Action, no reiteration of that rejection is found so it is assumed that the Examiner has withdrawn those rejections.

Applicants have attempted in this Appeal Brief to address the Examiner's comments and to point out how the claims are presently in an allowable form.

In view of the arguments herein urging patentability of the claims, allowance of the claims in this case is warranted. Such favorable action by this Honorable Board is respectfully solicited.

July 13, 2001

Respectfully Submitted,



Thomas A. Beck

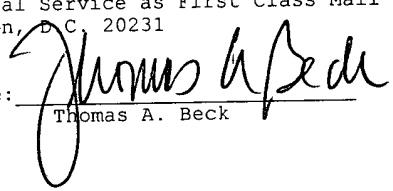
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I hereby certify that this Appeal paper is being deposited on the date indicated below with the U.S. Postal Service as First Class Mail addressed to Commissioner of Patents & Trademarks, Washington, D.C. 20231

Signature: 

Name:

Thomas A. Beck

Date: July 13, 2001

APPENDIX

CLAIMS INVOLVED IN THE INSTANT APPEAL

What is claimed is:

1. A method comprising:

forming an admixture of a solvent, an additive and a polymer selected from the group consisting of a precursor to an electrically conductive polymer and an electrically conductive polymer said polymer being soluble in said solvent said polymer not being substantially soluble in said additive in the absence of said solvent;

said additive provides local mobility to said polymer to allow said polymer to associate with one another to achieve a crystalline state; and

removing or partly removing said solvent substantially leaving said additive therein as remaining additive, said remaining additive provides local mobility to said polymer to achieve said crystalline state.

2. A method according to claim 1, wherein said admixture is electrically conductive and has an isotropic electrical conductivity.

3. A method according to claim 1, wherein said additive is selected from the group consisting of plasticizers and diluents.

4. A method according to claim 1, wherein said additive is a plasticizer is selected from the group consisting of: Adipic acid plasticizers, Azelaic acid plasticizers, Benzoic acid plasticizers, Citric acid plasticizers, Dimer acid plasticizers, Epoxy plasticizers, Fumaric acid plasticizers, Glycerol plasticizers, Isobutyrate plasticizers, Lauric acid plasticizers, Linoleic acid plasticizers, Maleic acid plasticizers, Sebacic acid plasticizers, Stearic acid plasticizers, Succinic acid plasticizers, Sulfonic acid plasticizers, Terpentines, Terpentine plasticizers, Siloxanes, Polysiloxanes, Ethylene glycols, Polyethylene glycols, Polyesters, Sucrose plasticizers, Mellitates, Myristic acid plasticizers, Oleic acid plasticizers, Palmitic acid plasticizers, Paraffin plasticizers, Phosphoric acid plasticizers, Phthalic acid plasticizers, Ricinoleic acid plasticizers, Tartaric acid plasticizers, Trimellitic acid plasticizers, Glycol plasticizers, Glycolates, Hydrocarbons, Phosphonic acid plasticizers, Polysilanes.

5. A method according to claim 1, wherein said polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylene vinylenes, polyparaphenylenes, polyanilines, polythiophenes, polyazines, polyfuranes, polypyrroles, polyselenophenes, poly-p-phenylene sulfides, polyacetylenes formed from soluble precursors, combinations thereof and blends thereof with other polymers and copolymers of the monomers thereof.

6. A method according to claim 1, wherein said, solvent when removed or partly removed forms a film which is further stretch oriented.

7. A method comprising:

forming a combination of a first material, a second material and a solvent:

said first material is selected from the group consisting of a precursors to an electrically conductive polymer and an electrically conductive polymer;

said second material being soluble in said solvent, said second material not being substantially soluble in said first material in the absence of said solvent.

8. A method according to claim 7, wherein said combination is electrically conductive and has a conductivity which is isotropic.

9. A method according to claim 7, wherein said polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylene vinylenes, polythianophthenes, polyparaphenylenes, polyanilines, polythiophenes, polyazines, polyfuranes, polypyrroles, polyselenophenes, poly-p-phenylene sulfides, polyacetylenes formed from soluble precursors, combinations thereof and blends thereof with other polymers and copolymers of the monomers thereof.

10. A method according to claim 7, wherein said second material is selected from the group consisting of:

Adipic acid plasticizers, Azelaic acid plasticizers, Benzoic acid plasticizers, Citric acid plasticizers, Dimer acid plasticizers, Epoxy plasticizers, Fumaric acid plasticizers, Glycerol plasticizers, Isobutyrate plasticizers, Lauric acid plasticizers, Linoleic acid plasticizers, Maleic acid plasticizers, Sebacic acid plasticizers, Stearic acid plasticizers, Succinic acid plasticizers, Sulfonic acid plasticizers, Terpentines, Terpentine plasticizers, Siloxanes, Polysiloxanes, Ethylene glycols, Polyethylene glycols, Polyesters, Sucrose plasticizers, Mellitates, Myristic acid plasticizers, Oleic acid plasticizers, Palmitic acid plasticizers, Paraffin plasticizers, Phosphoric acid plasticizers, Phthalic acid plasticizers, Ricinoleic acid plasticizers, Tartaric acid plasticizers, Trimellitic acid plasticizers, Glycol plasticizers, Glycolates, Hydrocarbons, Phosphonic acid plasticizers, Polysilanes.

11. A method comprising forming a polyaniline material having at least one crystal grain, said material having isotropic electrical conductivity.

12. A method comprising:

providing solution of polymers in a solvent;

said polymers are selected from the group consisting of precursors to electrically conductive polymers and electrically conductive polymers;

providing mobility to said polymers to allow said polymers to associate with one another to achieve a crystalline state by adding a plasticizer to said solvent;

said plasticizer being soluble in said solvent. said plasticizer not being substantially soluble in said polymer in the absence of said solvent.

13. A method according to claim 12, wherein said step of providing mobility is provided by adding an additive to said solution.

14. A method according to claim 13, wherein solid additive is selected from the group consisting of a plasticizer and a diluent.

15. A method according to claim 1, wherein said additive contains substituents which facilitates the miscibility of said polymer and said additive.
16. A method according to claim 1, wherein said additive disrupts aggregation of said polymer.
20. A method according to claim 1, wherein said additive deaggregates said polymer.
22. A method according to claim 1, wherein said solvent is extracted from said admixture by a technique selected from the group consisting of solvent extraction and evaporation.
23. A method according to claim 1, wherein said additive is first added to a solvent and thereafter an electrically conducting polyaniline is added which becomes neutralized upon addition to said admixture.
24. A method according to claim 1, wherein said admixture further includes monomer of said precursor, and an oxidant.
25. A method according to Claim 1, wherein said additive includes a plasticization effect.
40. A method according to claim 1 wherein said additive is an oxidant.
41. A method according to claim 7 wherein said material is an oxidant.
42. A method according to claim 12 wherein said plasticizer is an oxidant.